TMR2101

Large Dynamic Range TMR linear sensor

General Description

The TMR2101 linear sensor utilizes a unique push-pull half bridge composed of four unshielded TMR sensor elements. The unique bridge design provides a high sensitivity signal output that is linearly proportional to a magnetic field applied parallel to the surface of the sensor package, and it provides superior temperature compensation of the output.The TMR2101 is available in a 6 mm X 5 mm X1.7 mm SOP8 package.

Features and Benefits

- Tunneling Magneto resistance (TMR) Technology
- High Sensitivity
- Large Dynamic Range
- Very Low Power Consumption
- Excellent Thermal Stability
- Very Low Hysteresis
- Compatible with Wide Range of Supply Voltages

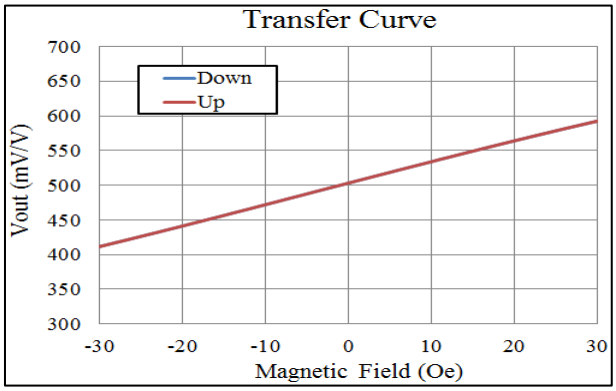
TMR2101

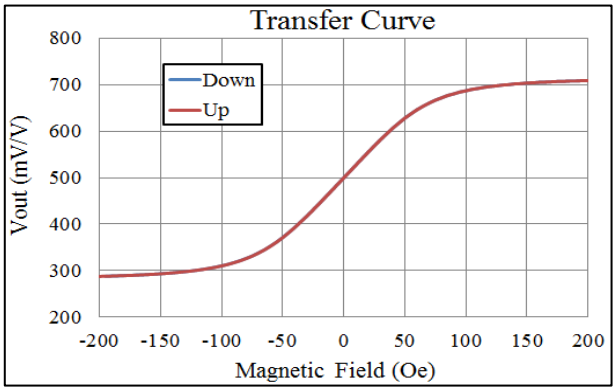
Applications

- Weak Magnetic Field Sensing
- Current Sensors
- Displacement Sensing
- Rotary Position Sensors

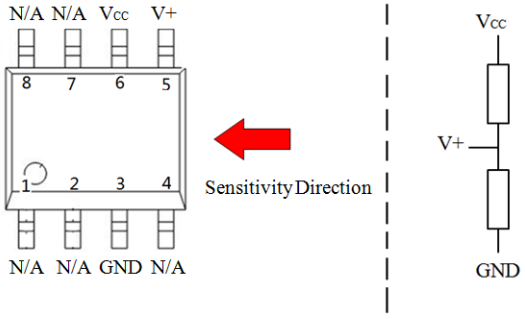
Transfer Curve

The following figure shows the response of the TMR2101 to an applied magnetic field in the range of ±30Oe (left) and ±200 Oe (right) when the TMR2101 is biased at 1V. At low fields the TMR2101 response is highly linear, and it is not harmed when the sensor is driven into saturation.





Pin Configuration



Top View

Pin No.	Pin Name	Pin Function
1,2,4,7,8	N/A	Not Connected
3	GND	Ground
5	V+	Half Bridge Output
6	V_{cc}	Supply Voltage

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage	V_{CC}	7	V
Reverse Supply Voltage	V_{RCC}	7	V
Max Exposed Field	H_E	1000	Oe(1)
ESD Voltage	V_{ESD}	4000	V
Operating Temperature	T_A	-40~125	°C
Storage Temperature	T_{stg}	-50 ~150	°C

Specification (V_{CC}=1.0V, T_A=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	Operating		1	7	V
Supply Current	I_{CC}	Output Open		5		μA
Resistance	R			200(2)		kOhm
Sensitivity	SEN	Fit @±30Oe		3		mV/V/Oe
Saturation Field	H_{sat}			±70		Oe
Range Linear		1% Non-linearity		±30		Oe
Offset Voltage	V_{offset}			±2.5		mV/V
Hysteresis	Hys	Fit @±30Oe		0.1		%FS
Temperature Coefficient of Offset	TCO	H = 0 Oe		0.005		mV/V/°C
Temperature Coefficient of Sensitivity	TCS			-1000		PPM/°C

Notes:

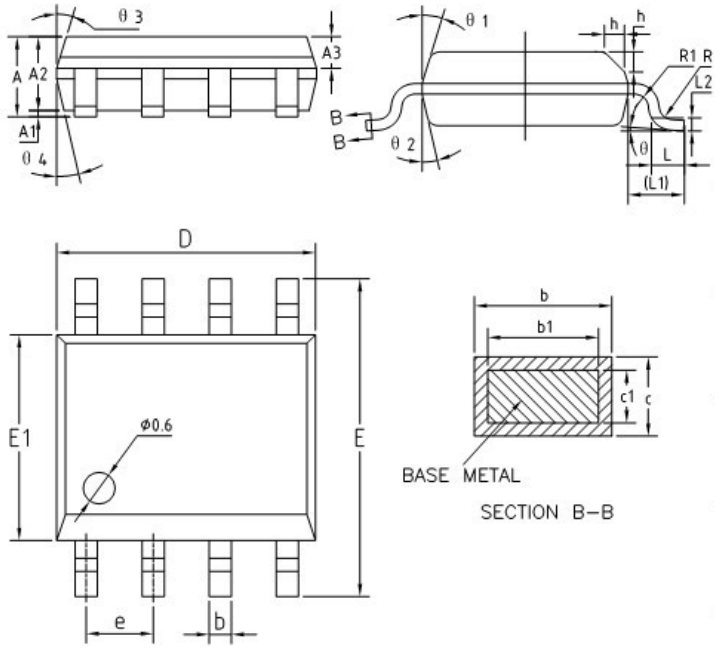
(1) 1 Oe (Oersted) = 1 Gauss in air = 0.1 millitesla = 79.8 A/m.

(2) Custom sensor resistance may be available upon request.

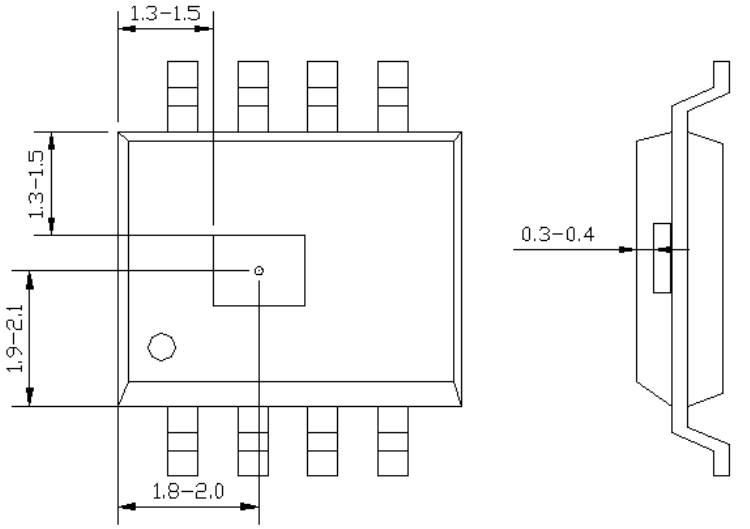
Package Information

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	–	0.51
b1	0.37	0.42	0.47
c	0.18	–	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	–	–
R1	0.07	–	–
h	0.30	0.40	0.50
θ	0°	–	8°
θ1	15°	17°	19°
θ2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°



TMR Sensor Position



Top view and side view(unit: mm)

RoHS COMPLIANT

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